CHAPTER 2

DESCRIPTION OF THE LOWER ELK RIVER WATERSHED

2.1. BACKGROUND. The Lower Elk River Watershed contains low to moderate gradient streams, with productive, nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally, high densities of fish. Streams are characterized by coarse chert gravel and sand substrates with areas of bedrock and relatively clear water.

Much of the land in this watershed is used for agriculture, including row crops and pasture.

This Chapter describes the location and characteristics of the Lower Elk River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Lower Elk River Watershed is located in Middle Tennessee and includes parts of Giles, Lawrence, Marshall, and Maury Counties.

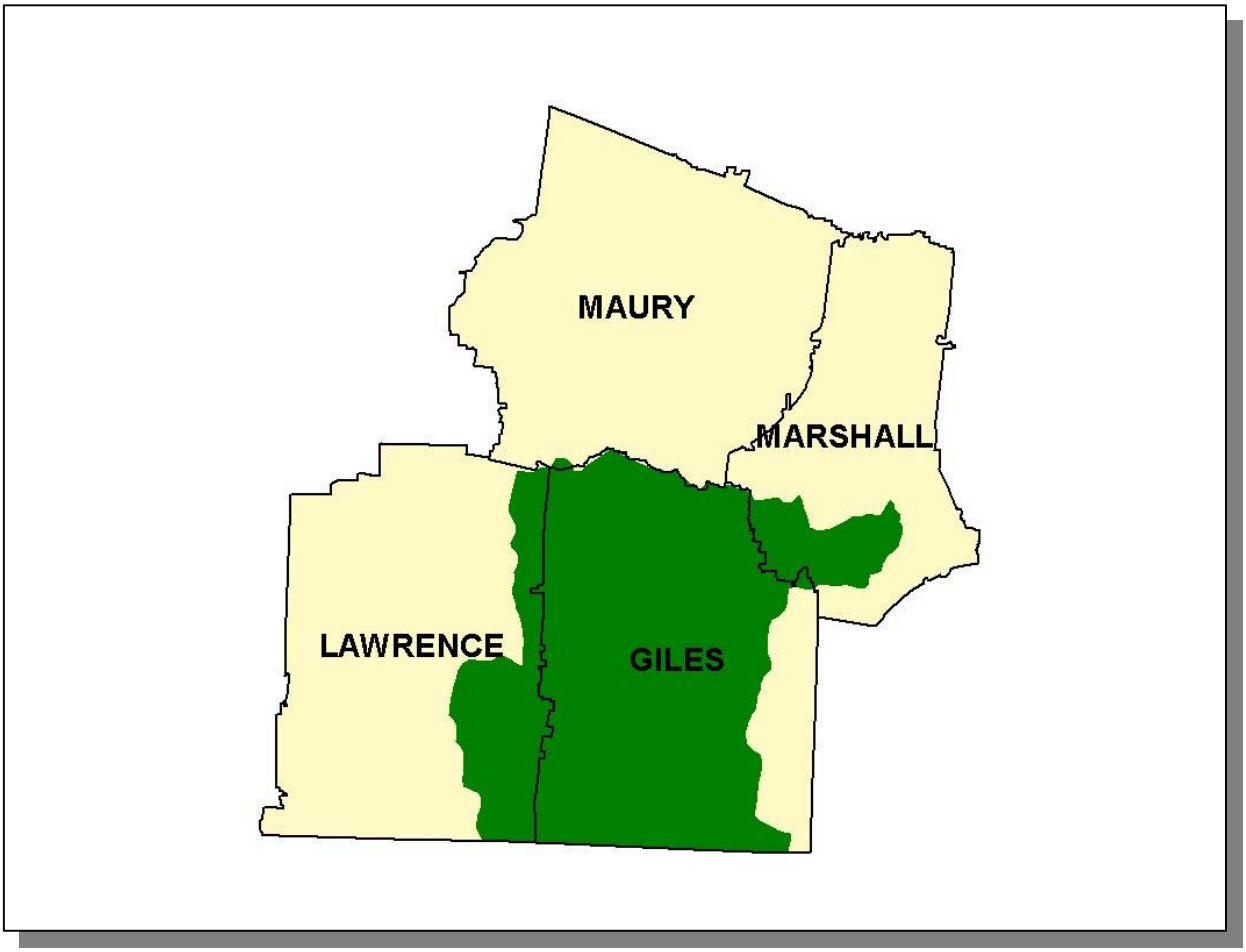

Figure 2-1. General Location of the Lower Elk River Watershed in Tennessee.

COUNTY	% OF WATERSHED IN EACH COUNTY
Giles	74.1
Lawrence	17.3
Marshall	8.4
Maury	0.2

Table 2-1. The Lower Elk River Watershed Includes Parts of Four Middle Tennessee Counties.

2.2.B. Population Density Centers. One interstate (I-65) and three state highways serve the major communities in the Tennessee Portion of the Lower Elk River Watershed.

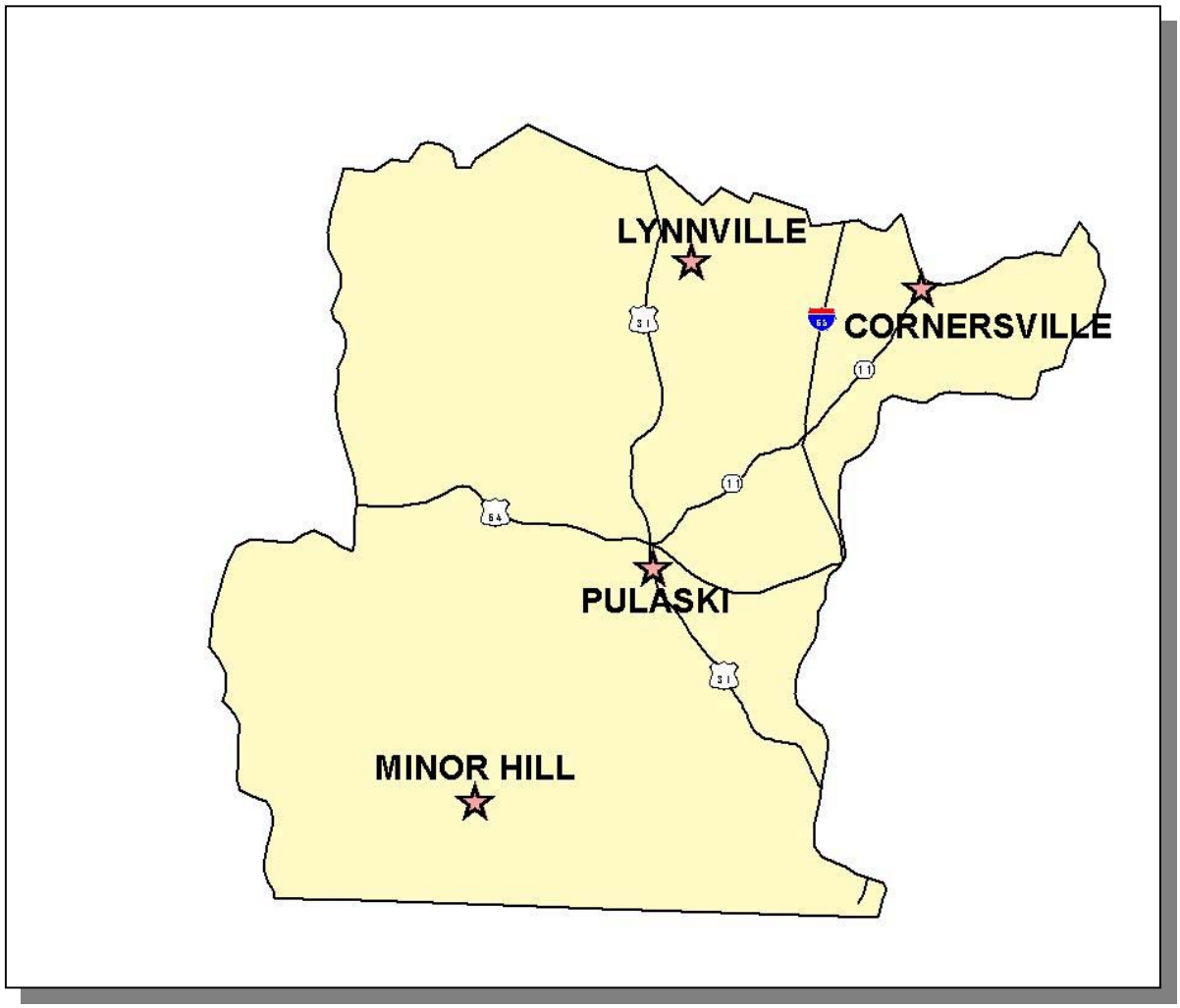

Figure 2-2. Municipalities and Roads in the Tennessee Portion of the Lower Elk River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Pulaski*	8,667	Giles
Cornersville	802	Marshall
Minor Hill	403	Giles
Lynnville	367	Giles

Table 2-2. Municipalities in the Tennessee Portion of the Lower Elk River Watershed. *Population based on 1996 census (Tennessee Blue Book). Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Lower Elk River Watershed, designated the Hydrologic Unit Code 06030004 by the USGS, drains approximately 964 square miles, 715 square miles in Tennessee, and drains to the Elk River.

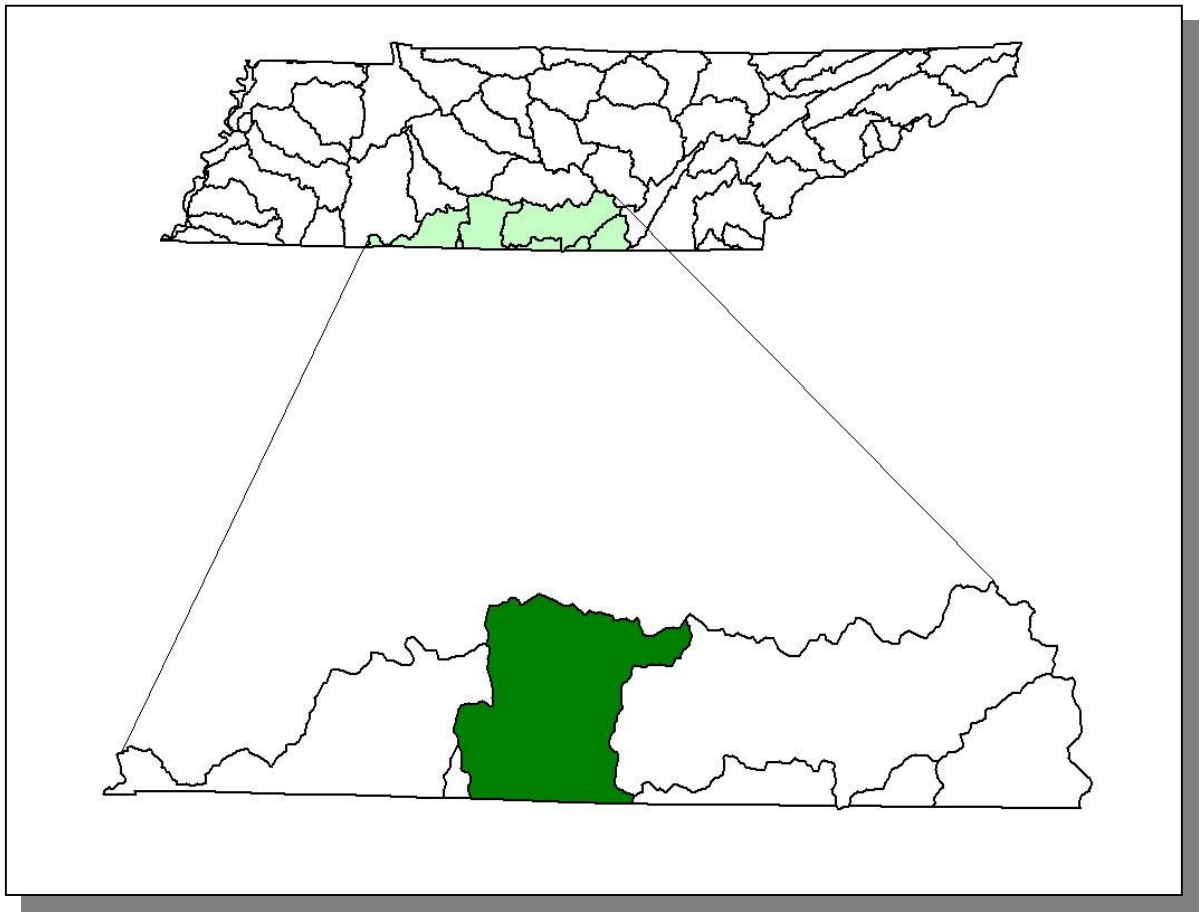

Figure 2-3. The Lower Elk River Watershed is Part of the Lower Tennessee River Basin.

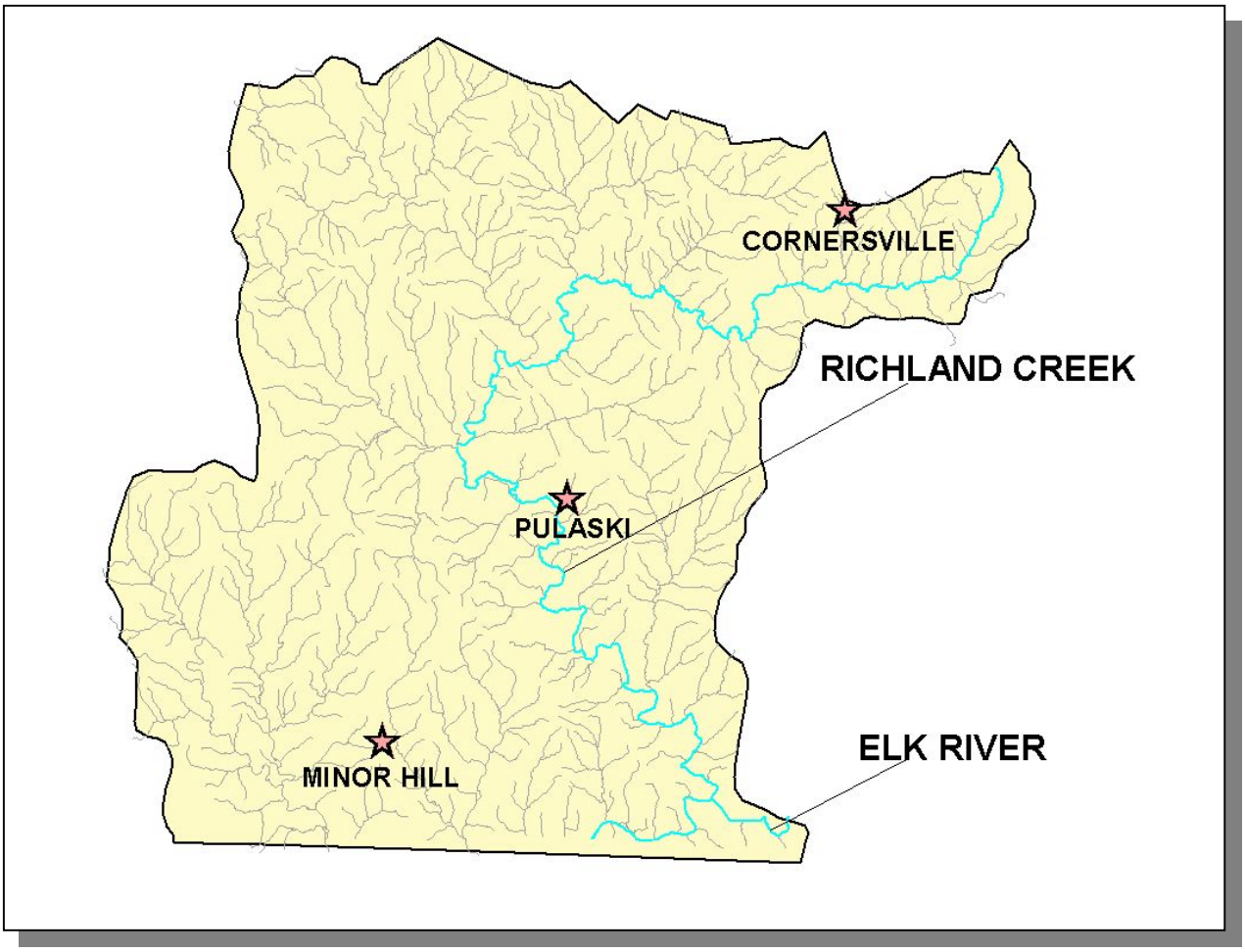

Figure 2-4. Hydrology in the Tennessee Portion of the Lower Elk River Watershed. *There are 1,552 total stream miles recorded in River Reach File 3 in the Lower Elk River Watershed. 1,117 stream miles are recorded in Tennessee. Locations of Elk River, Richland Creek, and the cities of Cornersville, Minor Hill, and Pulaski are shown for reference.*

2.3.B. Dams. There are 6 dams inventoried by TDEC Division of Water Supply in the Tennessee Portion of the Lower Elk River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

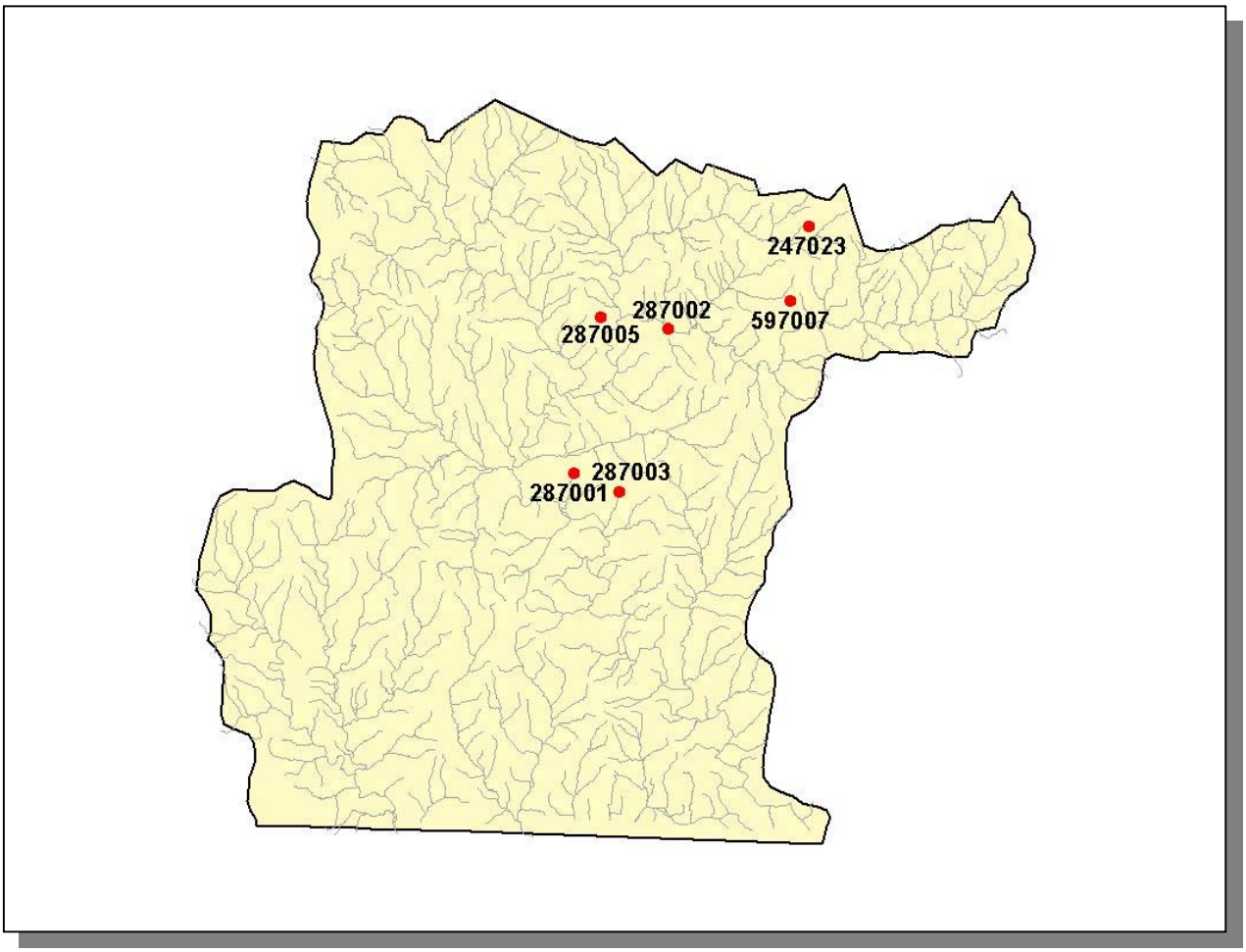

Figure 2-5. Location of Inventoried Dams in the Tennessee Portion of the Lower Elk River Watershed. *More information is provided in Lower Elk-Appendix II and on the TDEC homepage at: http://gwidc.gwi.memphis.edu/website/dams/viewer.htm*

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

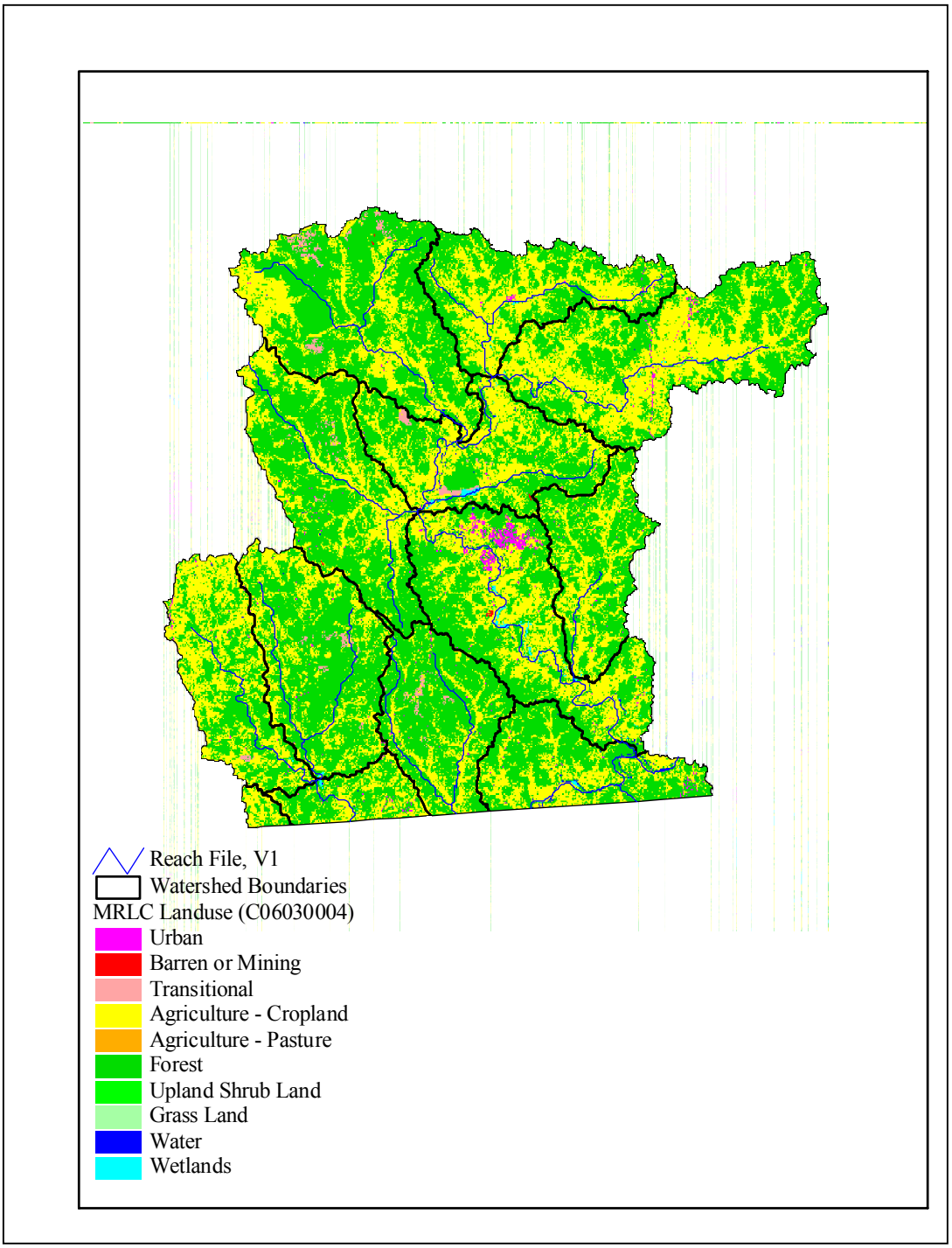

Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

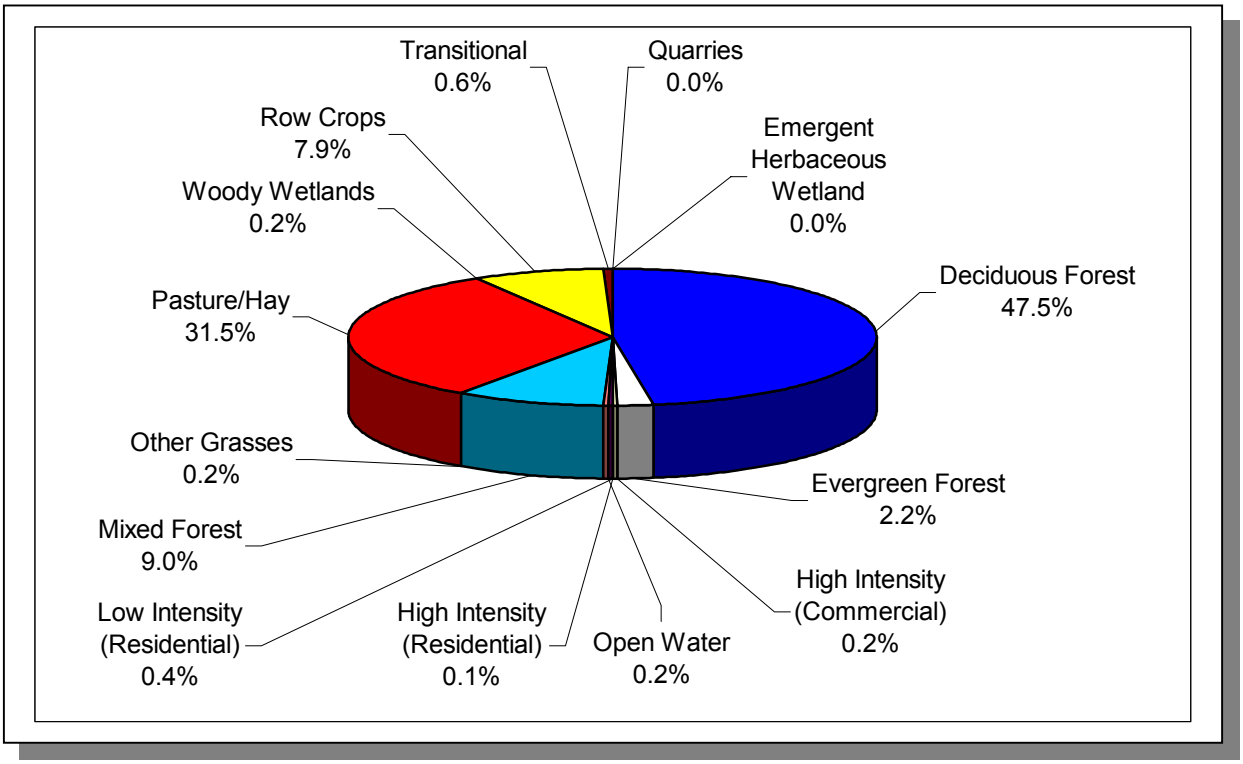

Figure 2-7. Land Use Distribution in the Tennessee Portion of the Lower Elk River Watershed. *More information is provided in Lower Elk-Appendix II.*

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are defined as relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies include the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Lower Elk River Watershed lies within 1 Level III ecoregion (Interior Plateau) and contains 3 Level IV subecoregions (Griffen, Omernik, Azavedo, 1997):

- Western Highland Rim (71f) is characterized by dissected, rolling terrain of open hills, with elevations of 400 to 1000 feet. The geologic base of Mississippian-age limestone, chert, and shale is covered by soils that tend to be cherty, acidic and low to moderate in fertility. Streams are characterized by coarse chert gravel and sand substrates with areas of bedrock, moderate gradients, and relatively clear water. The oak-hickory natural vegetation was mostly deforested in the mid to late 1800's, in conjunction with the iron ore related mining and smelting of the mineral limonite, but now the region is

again heavily forested. Some agriculture occurs on the flatter areas between streams and in the stream and river valleys: mostly hay, pasture, and cattle, with some cultivation of corn and tobacco.

- The Eastern Highland Rim (71g) has more level terrain than the Western Highland Rim (71f), with landforms characterized as tablelands of moderate relief and irregular plains. Mississippian-age limestone, chert, shale, and dolomite predominate, and karst terrain sinkholes and depressions are especially noticeable between Sparta and McMinnville. Numerous springs and spring-associated fish fauna also typify the region. Natural vegetation for the region is transitional between the oak-hickory type to the west and the mixed mesophytic forests of the Appalachian ecoregions (68,69) to the east. Bottomland hardwoods forests were once abundant in some areas, although much of the original bottomland forest has been inundated by several large impoundments. Barrens and former prairie areas are now mostly oak thickets or pasture and cropland.

- Outer Nashville Basin (71h) is a more heterogeneous region than the Inner Nashville Basin, with more rolling and hilly topography and slightly higher elevations. The region encompasses most all of the outer areas of the generally non-cherty Ordovician limestone bedrock. The higher hills and knobs are capped by the more cherty Mississippian-age formations, and some Devonian-age Chattanooga shale, remnants of the Highland Rim. The region's limestone rocks and soils are high in phosphorus, and commercial phosphate is mined. Deciduous forests with pasture and cropland are the dominant land covers. Streams are low to moderate gradient, with productive nutrient-rich waters, resulting in algae, rooted vegetation, and occasionally high densities of fish. The Nashville Basin as a whole has a distinctive fish fauna, notable for fish that avoid the region, as well as those that are present.

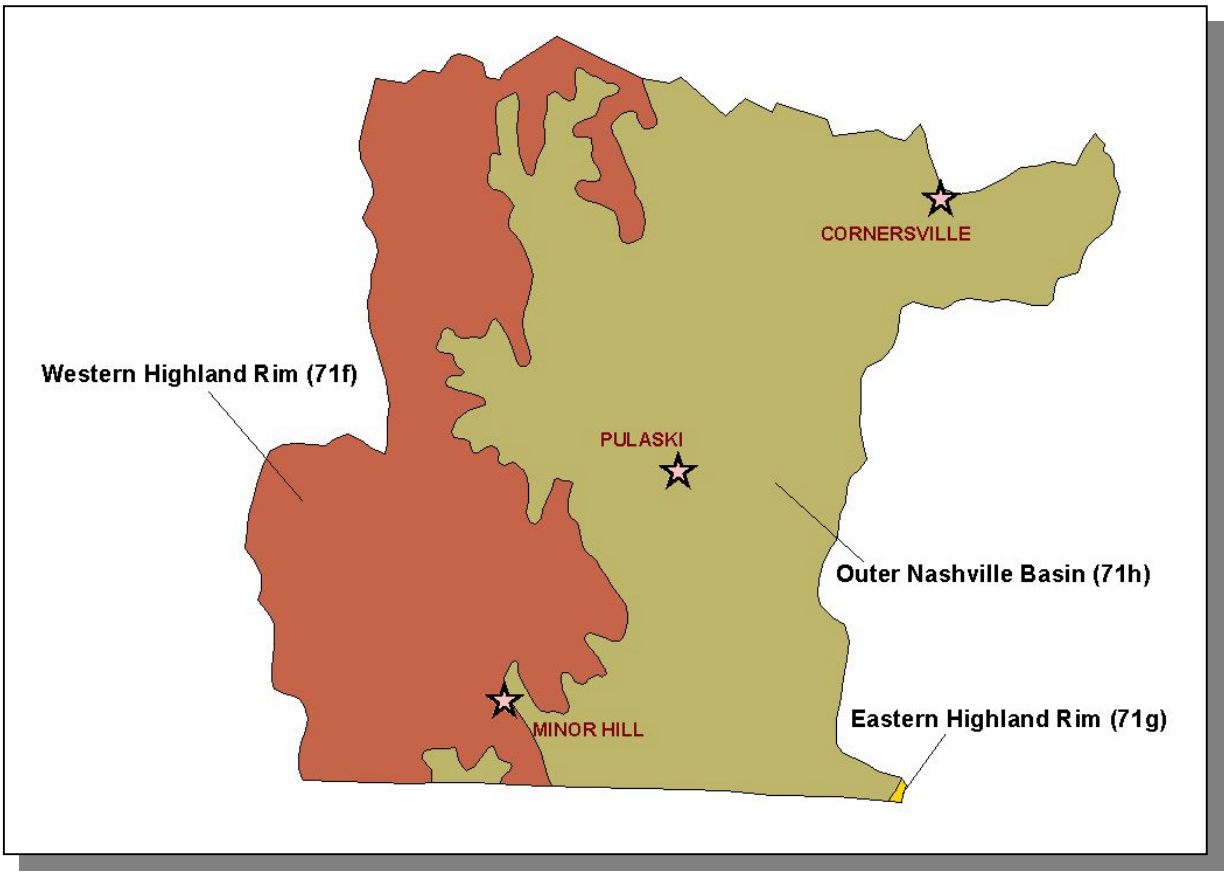

Figure 2-8. Level IV Ecoregions in the Tennessee Portion of the Lower Elk River Watershed. *Locations of Cornersville, Minor Hill, and Pulaski are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

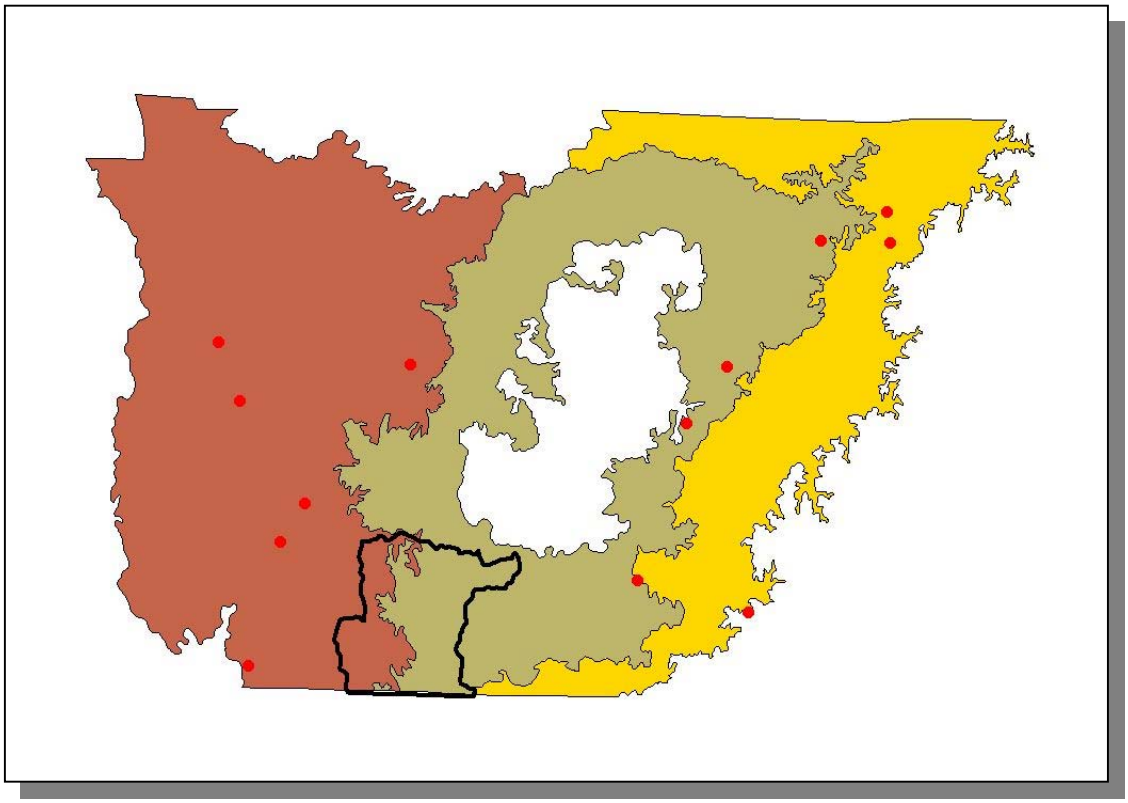

Figure 2-9. Ecoregion Monitoring Sites in the Tennessee Portion of Level IV Ecoregions 71f, 71g, and 71h. *The Tennessee Portion of the Lower Elk River Watershed is shown for reference. More information is provided in Lower Elk-Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	0
Insects	0
Mussels	1
Snails	1
Amphibians	0
Birds	2
Fish	2
Mammals	0
Reptiles	0
Plants	5
Total	**11**

Table 2-3. There are 11 Rare Plant and Animal Species in the Tennessee Portion of the Lower Elk River Watershed.

Additionally, in the Tennessee portion of the Lower Elk River Watershed, there are two rare fish species, one rare mussel species, and one rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Etheostoma wapiti	Boulder darter	LE	E
Percina tanasi	Snail darter	LT	T
Toxolasma cylinderellus	Pale lilliput	LE	E
Lithasia lima	Warty rocksnail		

Table 2-4. Rare Aquatic Species in the Tennessee Portion of the Lower Elk River Watershed. *Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service; LT, Listed Threatened by the U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found at http://www.state.tn.us/environment/nh/tnanimal.html.*

2.6.B. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

http://www.state.tn.us/environment/epo/wetlands/strategy.zip.

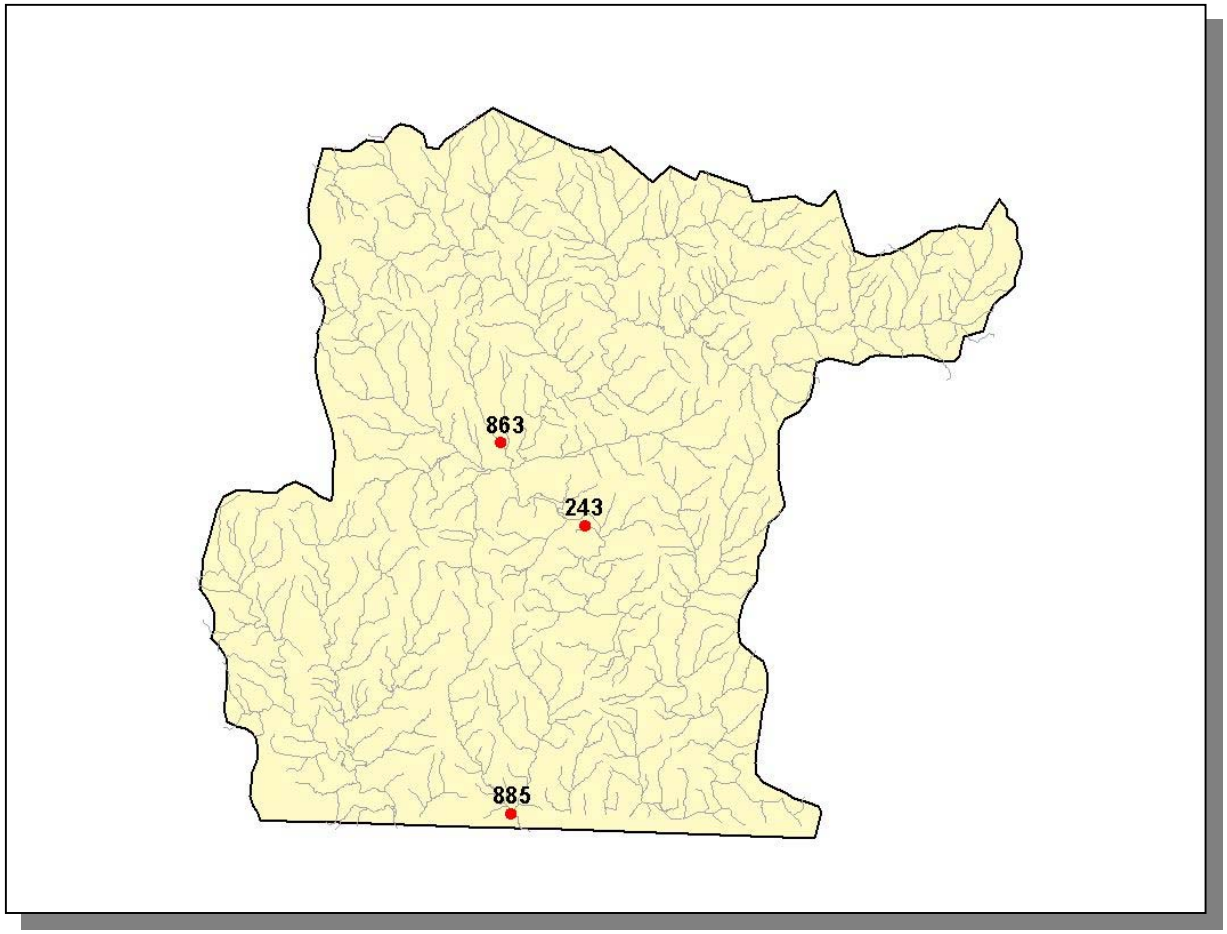

Figure 2-10. Location of Wetland Sites in TDEC Division of Natural Heritage Database in the Tennessee Portion of the Lower Elk River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands in the watershed*. More information is provided in Lower Elk-Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of one stream in the Lower Elk River Watershed:

Richland Creek. Scenic float stream.

RIVER	SCENIC	RECREATION
Richland Creek	X	X

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at http://www.ncrc.nps.gov/rtca/nri/tn.htm

2.7.B. Interpretive Areas.

Many local interpretive areas are common in the Lower Elk River Watershed, most notably, Giles County Park and Sam Davis Park.

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT.

The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/riv

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Agnew Creek	3			Leatherwood Creek	3		
Anderson Creek	2			Long Branch Clear Fork	3		
Big Creek	3		2,3	Lynn Creek	3		
Birch Branch Creek	3			Pigeon Roost Creek	3		2
Blue Creek	2			Pole Bridge Branch Creek	3		
Brownlow Creek	2			Prosser Creek	3		
Buchanan Creek	2	3		Richland Creek	2,3	3	
Choate Creek	3			Robertson Fork Richland Creek	2		
Clear Fork E.F. Sugar Creek	3			Shannon Creek	3		
Dry Creek	3			South Fork Blue Creek	2		
Dry Weakley Creek	2			Sugar Creek	3	3	
East Fork Shoal Creek	3			Weakley Creek	3		
East Fork Sugar Creek	3			West Fork Shoal Creek	3		
Elk River	2	2		West Fork Sugar Creek	3		
Factory Creek	2			West Weakley Creek	2		
Hams Creek	2			Yokley Creek	3		
Hurricane Creek	3						

Table 2-6. Stream Scoring from the Tennessee Rivers Assessment Project.

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed